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10/686,389	10/14/2003	Young Han Nam	KIM-10113	6308

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SCHMEISER OLSEN & WATTS
18 E UNIVERSITY DRIVE
SUITE # 101
MESA, AZ 85201

EXAMINER	
SIEDLER, DOROTHY S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/686,389	NAM ET AL.	
	Examiner	Art Unit	
	Dorothy Sarah Siedler	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10-14-03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This is the response to the amendment filled June 7, 2007. Claims 1-9 are pending and are considered below.

Response to Amendment

The applicant has successfully amended claims 1,2,4 and 6; therefore the 112 second paragraph rejection of these claims is withdrawn.

Response to Arguments

Applicant's arguments filed June 6, 2007 have been fully considered but they are not persuasive.

Applicant argues that, "Malvar does not disclose adjusting the amplitude of audio data that is to be encoded in a low bit rate in the codec such that the audio data is encoded in a bit rate higher than or equal to the low bit rate. That is, Malvar does not disclose preprocessing the audio data before the audio data is processed by the codec according to the present invention" (Remarks page 3). In addition, the applicant argues, "Rather, Malvar discloses automatic gain control as part of a codec function" (Remarks page 4). The examiner respectfully disagrees. ***Malvar*** discloses automatic gain control, i.e. adjusting the amplitude of a signal, in a signal enhancement mode *prior to processing by the codec*. Specifically, ***Malvar*** discloses, "Audio paths used with current codecs may include, *prior to processing by the codecs*, a signal enhancement model",

and gives an example. ***Malvar*** also discloses that, "Other enhancement operators may include automatic gain control, noise reducers, etc.".

In response to applicant's argument that "Malvar does not disclose adjusting the amplitude of audio data that is to be encoded in a low bit rate in the codec such that the audio data is encoded in a bit rate higher than or equal to the low bit rate" (Remarks page 3), as well as that, "the present invention performs the AGC preprocessing of frames such that the AGC preprocessed frames are encoded in a higher bit rate rather than reducing noise from the frames" (Remarks page 4), the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to applicant's argument that "Malvar does not disclose adjusting the amplitude of audio data that is to be encoded in a low bit rate in the codec such that the audio data is encoded in a bit rate higher than or equal to the low bit rate" (Remarks page 3), a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by ***DeJaco*** (5,742,734).

As per claim 1, ***DeJaco*** discloses a method for preprocessing audio data to be processed by a predetermined codec having variable coding rate, comprising the steps of:

Classifying the audio data selected based on a characteristic of the audio data (column 2 lines 15-18 and lines 39-42, *the input signal is analyzed to determine the presence of speech or music then processed accordingly*).

Preprocessing frames of audio data selected based on the classification before the audio data is subject to the codec (column 3 lines 57-65, *the subband energy is determined for each subband, then used to determine the coding rate*).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***DeJaco*** (5,742,734) in view of ***Malvar*** (6,029,126).

As per claims 4 and 6, ***DeJaco*** discloses a method for preprocessing audio data to be processed by a codec having variable coding rate, comprising the steps of: deciding an interval of audio data that is to be encoded in a low bit rate in said codec (column 3 lines 56-65). ***DeJaco*** does not explicitly disclose adjusting the amplitude of audio data of the decided interval before the audio data is processed by the codec, such that the audio data in the interval may be encoded in a bit rate higher than or equal to said low bit rate when processed by the codec. However, ***DeJaco*** does disclose that previous speech coding systems do not correctly determine when low energy unvoiced speech is input (column 1 lines 40-52). The systems often mistake low energy unvoiced speech as noise, and encode the signal at a lower bit rate which causes a degradation in speech quality during speech reconstruction (column 1 lines 40-52). ***Malvar*** discloses that signal enhancement functions are often used to enhance a signal prior to processing by the codec, automatic gain control being one of those functions (column 2 lines 41-51). The enhancement functions are used to transform the signal in order to increase encoding accuracy.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the amplitude (enhancement) of the audio data in ***DeJaco***, in order to distinguish the unvoiced speech signal from noise then correctly encode the frame at a higher bit rate, thus reducing encoding errors and increasing resolution during speech reconstruction.

As per claim 7, ***DeJaco*** discloses a method for preprocessing audio data to be processed by a codec having variable coding rate, wherein the codec is capable of determining whether data fed to the codec is noise signal or not, comprising the steps of:

Deciding whether a frame in the audio data would be determined as noise signal when the audio data is processed by the codec (column 2 lines 15-18 and lines 39-42, *the input signal is analyzed to determine the presence of speech or music. If the input signal is neither speech nor music, then it must be noise or silence with background noise*).

DeJaco does not disclose that if the signal is determined as noise signal, preprocessing the frame such that the preprocessed frame is not determined as noise when processed by the codec. However, ***DeJaco*** does disclose that previous speech coding systems do not correctly determine when low energy unvoiced speech is input (column 1 lines 40-52). The systems often mistake low energy unvoiced speech as noise, and encode the

signal at a lower bit rate which causes a degradation in speech quality during speech reconstruction (column 1 lines 40-52). ***Malvar*** discloses that signal enhancement functions are often used to enhance a signal prior to processing by the codec, automatic gain control being one of those functions (column 2 lines 41-51). The enhancement functions are used to transform the signal in order to increase encoding accuracy.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to preprocess the frame determined as signal noise in ***DeJaco***, in order to distinguish the unvoiced speech signal from noise then correctly encode the frame at a higher bit rate, thus reducing encoding errors and increasing resolution during speech reconstruction.

As per claim 8, ***DeJaco*** does not disclose preprocessing audio data before the audio data is transmitted through the transmission channel, such that the audio data is processed in the codec in a higher bit rate from the bit rate without the preprocessing. However, ***DeJaco*** does disclose the compression of an audio signal prior to transmission (column 1 lines 40-43). In addition, ***DeJaco*** also discloses that previous speech coding systems do not correctly determine when low energy unvoiced speech is input (column 1 lines 40-52). The systems often mistake low energy unvoiced speech as noise, and encode the signal at a lower bit rate which causes a degradation in speech quality during speech reconstruction (column 1 lines 40-52). ***Malvar*** discloses that signal enhancement functions are often used to enhance a signal prior to processing by the codec, automatic gain control being one of those functions (column 2

lines 41-51). The enhancement functions are used to transform the signal in order to increase encoding accuracy.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to preprocess audio data before the data is transmitted through the transmission channel in ***DeJaco***, in order to distinguish the unvoiced speech signal from noise then correctly encode the frame at a higher bit rate, thus reducing encoding errors and increasing resolution during speech reconstruction.

As per claim 9, ***DeJaco*** does not disclose a means for adjusting the amplitude of the audio data such that the audio data is processed in the codec in higher bit rate from the bit rate without the amplitude adjustment. However, ***DeJaco*** also discloses that previous speech coding systems do not correctly determine when low energy unvoiced speech is input (column 1 lines 40-52). The systems often mistakes low energy unvoiced speech as noise, and encode the signal at a lower bit rate which causes the voice quality to become degraded during speech reconstruction (column 1 lines 40-52). ***Malvar*** discloses that signal enhancement functions are often used to enhance a signal prior to processing by the codec, automatic gain control being one of those functions (column 2 lines 41-51). The enhancement functions are used to transform the signal in order to increase encoding accuracy.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to preprocess audio data before the data is transmitted through the

transmission channel in ***DeJaco***, in order to distinguish the unvoiced speech signal from noise then correctly encode the frame at a higher bit rate, thus reducing encoding errors and increasing resolution during speech reconstruction.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***DeJaco*** in view of ***Malvar,*** further in view of ***Davis*** (4,539,526).

As per claim 2, ***DeJaco*** discloses a method for preprocessing audio data to be processed by a predetermined codec having variable coding rate, comprising the steps of: classifying the audio data based on a characteristic of the audio data (column 2 lines 15-18 and lines 39-42, *the input signal is analyzed to determine the presence of speech or music then processed accordingly*). However, ***DeJaco*** does not disclose in case the audio data includes monophonic sound, performing AGC (automatic gain control) preprocessing of all frames, and in case the audio data includes polyphonic sound, performing AGC preprocessing of selected frames. ***Malvar*** discloses that signal enhancement functions are used to enhance a signal prior to processing by the codec, automatic gain control being one of those functions (column 2 lines 41-51). The enhancement functions are used to transform the signal in order to increase encoding accuracy. In addition, ***Davis*** discloses a system that performs preemphasis on a signal prior to encoding or decoding, that preemphasis based on a ratio of high frequency energy to low frequency energy (column 2 lines 50-67). ***Davis*** also discloses that

conventionally, preemphasis is used to adjust a signal level to below a maximum level or above a noise level. Monophonic music, having one tone or pitch, would have a constant ratio of high frequency energy to low frequency energy; therefore any preemephasis needed would take place over every frame of the signal. Polyphonic music would have a ratio of high frequency energy to low frequency energy that varies, depending on the tones being played at that time. The amount of preemphasis needed would depend on the tones being played during a particular frame.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the gain for all frames in monophonic music and selected frames in polyphonic music in ***DeJaco*** and ***Malvar***, in order to adjust the signal to below a maximum level and above a minimum noise level, thus reducing errors in a bandlimited application, such as encoding and decoding prior to transmission, as indicated in ***Davis*** (column 1 lines 31-36 and column 2 lines 46-65).

As per claim 3, ***DeJaco*** in view of ***Malvar*** and further in view of ***Davis*** disclose a method in accordance with claim 2, but ***DeJaco*** does not explicitly disclose wherein the step of performing AGC preprocessing of selected frames include deciding whether a frame in the audio data includes noise signal or not. However, ***DeJaco*** does disclose determining whether an input signal is noise or not (column 2 lines 15-18 and lines 39-42, *the input signal is analyzed to determine the presence of speech or music as compared to background noise. If the input signal is neither speech nor music, then it*

must be noise or silence with background noise). In addition, ***Malvar*** discloses that signal enhancement functions are used to enhance a signal prior to processing by the codec, automatic gain control being one of those functions (column 2 lines 41-51). The enhancement functions are used to transform the signal in order to increase encoding accuracy.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to determine if an input frame is noise or not during AGC preprocessing in ***DeJaco,*** in order to distinguish the unvoiced speech signal from noise, then correctly encode the frame at a higher bit rate, thus reducing errors and increasing resolution once it is decoded.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***DeJaco*** in view of ***Malvar*** as applied to claim 4 above, and further in view of ***Forse*** (4,912,766).

As per claim 5, ***DeJaco*** in view of ***Malvar*** discloses a method in accordance with claim 4, however neither ***DeJaco*** nor ***Melvar*** further disclose wherein the adjusting step comprises the steps of: calculating signal levels of the audio data, deciding smoothed gain coefficients based on signal levels, and generating preprocessed audio data by multiplying the smoothed gain coefficients to the audio data in the decided interval. However, ***Malvar*** discloses that signal enhancement functions are used to enhance a signal prior to processing by the codec, automatic gain control being one of those

functions (column 2 lines 41-51). In addition, ***Forse*** discloses a system that uses automatic gain control in a speech application (column 1 lines 45-58). The system inputs a speech signal, determines spectral parameters, stores gain coefficients for each spectral parameter then uses the lowest of the gain coefficients to adjust the magnitude of the spectral parameters. Therefore the examiner argues that it is old and well known to adjust the amplitude of an audio signal by multiplying the audio signal by gain coefficients.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to determine gain coefficients, and multiply those coefficients by the input signal in ***DeJaco***, since adjusting the amplitude through gain coefficients is a reliable and well known method, which would enable the system to distinguish the unvoiced speech signal from noise then correctly encode the frame at a higher bit rate, thus reducing encoding errors and increasing resolution once it is decoded.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dorothy Sarah Siedler whose telephone number is 571-270-1067. The examiner can normally be reached on Mon-Thur 9:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSS

TĀLIVALDIS IVARS ŠMITS
PRIMARY EXAMINER